



**ENGINEERING OPERATIONS COMMITTEE
MEETING MINUTES
FEBRUARY 6, 2008 – 9:00 A.M.
MULTI-MODAL CONFERENCE ROOM**

<i>Present:</i>	L. Tibbits B. O'Brien C. Roberts	J. Friend J. D. Culp T. Fudaly	J. Polasek T. Anderson E. Burns
<i>Absent:</i>	M. Van Port Fleet	J. W. Reincke	C. Bleech
<i>Guests:</i>	S. Minton S. Palmer	R. Till M. Eacker	A. Dionise (for J. Reincke) I. Gedaoun

OLD BUSINESS

1. Approval of the December 3, 2007, Meeting Minutes – L. Tibbits

The December 3, 2007, meeting minutes are approved.

2. Use of Adhesive Anchors in Sustained Tensile-Load Overhead Applications (See October 11, 1007, Minutes, New Business, Item 1) – R. Till

The National Transportation Safety Board (NTSB) recommends prohibiting the use of adhesive anchors in sustained tensile-load overhead applications, and implementing an inspection/repair program of sites where failure of the adhesive could result in a risk to the public. These recommendations were made in a letter from the NTSB to Director Steudle.

The department has used adhesive anchors for many different applications, from retrofitting barrier to adding signs to structures. For the most part, the use of adhesive anchors in sustained tensile-load overhead applications is avoided. However, there are numerous instances of adhesive anchors being used in sustained tensile load application in combination with shear loading.

In considering the NTSB's recommendation, department staff reviewed the following information:

- They surveyed other states and received 39 responses.
- They conducted random inspections on 111 sign supports and did not find any problems with the anchors used to attach the sign supports.
- They reviewed calculations of current sign supports – tension from dead load is only 1 to 6 percent of the ultimate tensile load of the anchor.
- They conducted laboratory testing of three adhesive anchors loaded past failure to create slips of 1/16", 1/8", and 1/4", after which sustained shear and tensile loads replicating typical sign supports were applied. All three anchors withstood the sustained shear and tensile load with less than 0.092" additional slip

As a result, the following actions are recommended:

- Allow existing signs to remain and perform routine inspections (include as part of bridge inspections).
- Issue a Bureau of Highway instructional memorandum with moratorium on future installations that will result in sustained tension only loading.
- Incorporate the moratorium in the *Bridge Design Manual*.
- Add a field to the Bridge Safety Inspection Report for appurtenances attached to the bridge.
- Add cantilever signs attached to retaining walls in the Inspection Program for Cantilever Sign Supports.
- The Construction and Technology Division will prepare a response to the NTSB.

ACTION: EOC approves the recommendations.

NEW BUSINESS

1. Pavement Demonstration Candidate Projects – C. Bleech

This item is withdrawn.

2. Sight Distance Guidelines – J. Townsend, M. Bott and I. Gedaoun

These guidelines provide information to department staff on stopping, passing, decision and intersection sight distance that are all critical design variables. The guidelines were updated to reflect current changes per the *2004 AASHTO Policy on Geometric Design of Highway and Streets*. This new guideline combines information currently available in several different locations, including AASHTO, MMUTCD, and the *Road Design Manual*. The Regions are currently using the guidelines in draft form.

ACTION: EOC approves the guidelines. The Traffic and Safety Division will make them available from their Web site.

3. Sign Guidelines for Hospitals – M. Bott

Per the Guidelines for Signing on State Trunkline Highways, “A maximum of two signs at the closest interchange to the hospital facility will be permitted if a hospital requests to have its name on the motorist service sign.” This statement is being interpreted in different ways, which as resulted in a varied of sign installations. To ensure uniformity in the application of this guideline, the following revision is recommended for approval:

A maximum of two signs indicating the name of the hospital facility may be installed at the closest interchange providing the most direct and appropriate route, with minimal turns by the driver to the hospital facility. If there are other interchanges within two miles of the hospital, the department may allow one additional interchange to be signed with the hospital symbol sign as long as the additional interchange also provides a direct alternate route to the hospital facility with minimal turns.

Approval of the above language will require minimal revisions to other warrants contained in the existing guidelines.

ACTION: EOC approves the revisions to the *Guidelines for Signing on State Trunkline Highways*.

4. 2008 Edition of the *HMA Production Manual* – S. Palmer

For approximately the last year, the Hot Mix Asphalt (HMA) Technical Subcommittee has been involved in changes to particular areas of the department's HMA Program, as directed by the HMA Operations Committee. Through their work, significant updates to the *HMA Production Manual* are recommended, resulting in a new edition. The primary revisions are in the HMA mix design express process, numerous HMA testing procedures due to specification changes, and the development of the HMA Laboratory and Technician Qualification Program, as required under the CFR. This edition of the manual reflects those changes and the need to make them effective for the upcoming 2008 construction season.

ACTION: EOC approves the 2008 edition of the *HMA Production Manual*. The Construction and Technology Division will issue BOH IM 2008-04 to provide notification of the new edition.

5. Update of the *Materials Quality Assurance Procedures Manual* – S. Palmer

The Construction and Technology Division is recommending revisions to the *Materials Quality Assurance Procedures Manual* to clarify protocol, reflect the current state of practice, and institute time frames for corrective actions on unsatisfactory HMA material's Independent Assurance Tests (IATs). The HMA IAT procedures need to be updated to more appropriately reflect the current state of practice, as required by FHWA. Also, the HMA IAT program is a required component of the HMA Laboratory and Technician Qualification Program (see Item 4 above).

ACTION: EOC approves the revisions to the *Materials Quality Assurance Procedures Manual*. The Construction and Technology Division will issue BOH IM 2008-03 to provide notification of the revisions.

6. Pavement Selections – B. Krom

a. Old US-27 Rehabilitation: CS 23812, JN 75222

The rehabilitation alternatives considered were a hot mix asphalt (HMA) over rubblized concrete (Alternative 1a – equivalent uniform annual cost [EUAC] \$32,767/directional mile) and a separated jointed plain concrete pavement overlay (Alternative 2a - EUAC \$34,232/directional mile), while the reconstruction alternatives being considered are a HMA Pavement (Alternative 2b – EUAC \$25,054/directional mile) and a jointed plain concrete pavement (Alternative 2b – EUAC \$28,114/directional mile). A life cycle cost analysis was performed and Alternatives 1a and 1b were approved based on having the lowest EUAC. The pavement design and cost analysis are as follows:

Alternative 1a (82.11 Percent of the Project) Rehabilitation: HMA Pavement Over Rubblized Concrete

1.5"	.....	HMA, 5E3, Top Course (mainline)
2"	.....	HMA, 4E3, Leveling Course (mainline)
3"	.....	HMA, 3E3, Base Course (mainline)
1.5"	.....	HMA, 5E03, Top Course (shoulders)
2"	.....	HMA, 4E03, Leveling Course (shoulders)
3"	.....	HMA, 3E03, Base Course (shoulders)

9"	Rubblized Existing JRCP (mainline)
	Existing Base and Subbase
6.5"	Total Section Thickness

Present Value Initial Construction Cost.....	\$387,947/directional mile
Present Value Initial User Cost.....	\$42,109/directional mile
Present Value Maintenance Cost	\$57,434/directional mile
Equivalent Uniform Annual Cost	\$32,767/directional mile

Alternative 1b (17.89 Percent of the Project) Reconstruction: HMA Pavement

1.5"	HMA, 5E3, Top Course (mainline)
2.25"	HMA, 4E3, Leveling Course (mainline)
3.75"	HMA, 3E3, Base Course (mainline)
1.5"	HMA, 5E03, Top Course (shoulders)
2.25"	HMA, 4E03, Leveling Course (shoulders)
6"	Aggregate Base (mainline)
9.75"	Aggregate Base (shoulders)
18"	Sand Subbase
6" dia.	Subbase Underdrain System
31.5"	Total Section Thickness

Present Value Initial Construction Cost.....	\$397,759/directional mile
Present Value Initial User Cost.....	\$48,318/directional mile
Present Value Maintenance Cost	\$44,992/directional mile
Equivalent Uniform Annual Cost	\$25,054/directional mile

Combined Equivalent Uniform Annual Cost.....	\$31,387/directional mile
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b. M-59 Reconstruction: CS 63043 and 50023, JN 55850

The reconstruction alternatives considered were a HMA pavement (Alternative 1 – EUAC \$152,396/directional mile) and a jointed plain concrete pavement (Alternative 2 - EUAC \$118,801/directional mile). A life cycle cost analysis was performed and Alternative 2 was approved based on having the lowest EUAC. The pavement design and cost analysis are as follows:

10"	Non-Reinforced Conc Pavt, P1 Modified, w/14' jt spacing (mainline & shldr)
16"	Open Graded Drainage Course
	Geotextile Separator
6" dia.	Open-Graded Underdrain System
26"	Total Thickness

Present Value Initial Construction Cost.....	\$1,054,120/directional mile
Present Value Initial User Cost.....	\$956,370/directional mile
Present Value Maintenance Cost	\$113,300/directional mile
Equivalent Uniform Annual Cost	\$118,801/directional mile

c. I-69 Reconstruction: CS 25084 and 44043, JN 79776

The reconstruction alternatives considered were a HMA pavement (Alternative 1 – EUAC \$105,474/directional mile) and a jointed plain concrete pavement (Alternative 2 - EUAC \$82,208/directional mile). A life cycle cost analysis was performed and

Alternative 2 was approved based on having the lowest EUAC. The pavement design and cost analysis are as follows:

11".....	Non-Reinforced Conc Pavt, P1 Modified, w/14' jt spacing (mainline & shldr)
6".....	Open Graded Drainage Course (mainline)
	Geotextile Separator
10".....	Sand Subbase (Reuse existing sand for 90% of project, replace for 10%)
6" dia.....	Open-Graded Underdrain System
27".....	Total Thickness
Present Value Initial Construction Cost.....	\$860,435/directional mile
Present Value Initial User Cost.....	\$534,441/directional mile
Present Value Maintenance Cost	\$74,745/directional mile
Equivalent Uniform Annual Cost	\$82,208/directional mile

7. Proposed Roundabouts at M-53 and 26 Mile Interchange With Pedestrian Access – S. Minton

The Michigan Roundabout Guide (approved at the November 2007 EOC meeting) states that EOC approval of a roundabout for compliance with ADA requirements is required whenever pedestrian access is present or major changes in pedestrian traffic are expected. An interchange with two multi-lane roundabouts is the preferred alternative for improving the interchange operations for this location. The FHWA, MDOT, Road Commission of Macomb County and local communities chose roundabouts for this interchange as the preferred alternative for improving operation and increasing safety. Anticipated pedestrian volumes are much lower than thresholds established in MMUTCD for consideration of pedestrian signals. Therefore, a standard crosswalk and sidewalk with ADA ramps are proposed for pedestrian access through the roundabouts.

ACTION: EOC approves the use of roundabouts at the M-53 and 26 Mile interchange, as well as the inclusion of pedestrian facilities through the roundabouts.

(Signed Copy on File at C&T)

Mike Eacker for Brenda J. O'Brien, Secretary
Engineering Operations Committee

ME:kar

cc:	K. Steudle	S. Mortel	J. Steele (FHWA)
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